CHICAGO NORTH SHORE & MILWAUKEE

# AN INTERURBAN GOES MODERN

BULLETIN NUMBER

23

# the Electroliners —

CENTRAL ELECTRIC RAILFANS' ASSOCIATION
CHICAGO, ILLINOIS

MARCH, 1941

FOREWORD:

The North Shore Line is so familiar to all railfans that detailed description of it is hardly needed here. Terminals, services and equipment have been thoroly studied in past CERA Bulletins (Nos. 1, 13) and on eight railfan inspection trips since June 1938. Timetables, copies of "North Shore Line News" and other North Shore Line data have been distributed many times to CERA members. But just for the sake of completeness let's review a few of the facts leading up to the introduction of the ELECTROLINERS.

The railroad extends the 85 miles from Chicago to Milwaukee with a high speed double track electric railroad using the Skokie Valley Route between Chicago and Waukegan for thru trains and the Shore Line Route for suburban service to North Shore residential areas. This is a highly competitive service in which the North Western and Milwaukee steam roads have a fast passenger schedule with a few trains of streamline equipment, and they have the advantage of private right of way into each terminal. The steam roads also extend much beyond Milwaukee and thru traffic on them consequently justifies propotionately greater expenditure in terminals and equipment. On the other hand the North Shore Line enjoys a very definite advantage in the location of its line conveniently to the residential and commercial urban areas and its flexible trains can be operated in shorter, more frequent blocks and can make extra stops in the outlying traffic centers of the terminal cities without appreciable sacrifice in schedule-- simply the old story of the value of electric railways.

Answering the challenge, the North Shore Line late in 1939 launched a program of rehabilitation and modernization starting with the Shore Line rolling stock, then extending to coaches and finally diner-lounge cars for the Skokie Valley. The "redesigned" cars, as this group has been named, are described elsewhere in this report, but they were the preliminary to the order for the thru service of two four-body articulated streamline trains, the ELECTROLINERS, whose construction was authorized by court order issued to Col. A. A. Sprague, Receiver of the road, on November 15, 1939, just one day after the first two modernized cars, numbers 716 and 717, went into regular service.

BUILDING THE ELECTROLINERS:

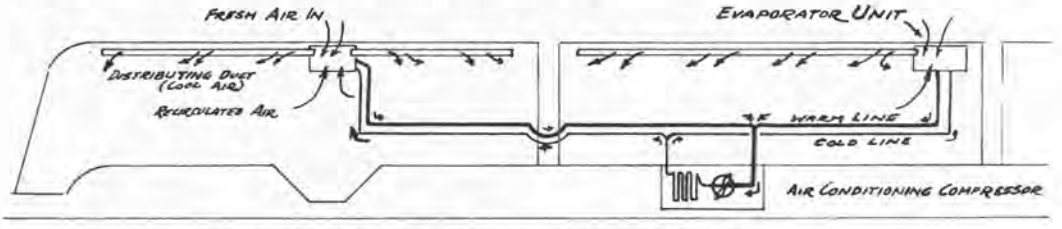
Tentative designs were drawn up and bids called for promptly for the two streamline trains -- they were not actually named ELECTROLINERS until the middle of the summer -- and the job was awarded to the St. Louis Car Company, low bidder with a figure totaling about $300,000, to be paid with an initial one-third in cash and the balance in receiver's certificates redeemed in time out of earnings. The contract was signed on December 6, 1939 and work began under the supervision of H. A. Otis, North Shore Line Engineer of Car Equipment. Tests and characteristics of motors, control, trucks, lighting, air brakes and auxiliaries had to be run and the best selected. Color schemes, seating and appointments had to be chosen -- all these details had to be studied before material could even be ordered. In view of the importance of these trains to the railroad they had to be right when delivered, even tho more time had to be used in construction. Assembly actually began in July 1940 and by November the bodies had been fabricated and electrical equipment installed. In the final month interior finish was installed and the work at the Builders' wound up in the middle of January, 1941.

DELIVERING THE ELECTROLINERS:

Train 801-802 was the first to be pronounced "ready" at St. Louis and with trolley poles wired down, special adapter drawbars and brake hose installed the train was picked up by a Terminal Railroad Association engine and taken across Merchants' Bridge over the Mississippi and delivered to the Alton Railroad at East St. Louis. Here it was coupled ahead of the caboose in a fast overnight freight and drawn to Glen Yard on the southwest side of Chicago for transfer thru the city on the Belt Railway of Chicago. Movement to the North Shore Line railhead at Racine wye was completed by a high speed Milwaukee Road freight and a standard merchandise dispatch motor freight car took the train the remaining 22 miles to the Harrison St., Milwaukee shop of the "Road of Service". The first train arrived in Milwaukee January 22 and the second, #803-804, on January 31, by the same procedure. An interesting sidelight on the second train delivery is that it left E. St. Louis in an Alton freight behind 4 PCC cars for street railway service in Philadelphia being shipped on flat cars.

DIMENSIONS, EQUIPMENT AND DETAILS OF ELECTROLINERS:

Number of Trains: Two. Number of Bodies per Train: Four. Refer to CERA Bulletin 22 for plans.
Numbering of Trains: First train, A Section - 801; A1 Section - 802.
Second train, A Section - 803; A1 Section - 804.
Designation of Bodies From Number 1 to Number 2 End of Train:
A - Coach, vestibule and smoking, with operating cab
B - Tavern Lounge C - Coach
A1- Coach, vestibule and smoking, with operating cab
Builder of Trains: St. Louis Car Company; St. Louis, Missouri; Order Number 1706.
Exterior Color Scheme: The principal body color is a medium blue green trimmed with 1½" salmon red stripes, applied two above the windows and nine below for the full length of train, with a solid red cowl-pilot and additional striping above the windows on the ends. The finish is rubbed to give a satin luster instead of gloss; the lettering, emblem, and a lightning-bolt motif is applied in silver leaf edged in black; and trucks and equipment are in black.
Interior Color Scheme: Varies from car to car, using pastel shades. Above the windows in each car there is a mural motif. The A section is finished in coral, blue and silver grey with coral upholstery and boy-and-girl-and-linden-bough mural motif. Section B the tavern-lounge, is finished in shades of tan, deep red and gold, with walnut and cork treatment of bar and murals on a gay animal motif. The C Section is silver grey and black trim with maroon seats and murals on an old-time carriage motif. The A1 section is finished in apricot, turquoise and brown with chocolate brown upholstery and "Dewitt Clinton" train motif.
Seating Capacity: 146 -- 30 in each coach section; 26 in the tavern-lounge.
Type of Seating: Tubular frame, semi-individual, deeply upholstered in mohair. In tavern-lounge section special appointments with fixed seating arrangement is employed.
Lighting: Individual fixtures with focussing glassware over each seat arranged in series circuits on the 600 v. trolley. In tavern-lounge car fixtures are in continuous strip, except around bar where individual fixtures and decorative lights under and behind the bar are on the 110 v. AC supply. Battery lights in fixtures are strategically located thruout the train to give lighting automatically in case of line voltage failure or third-rail gap. Coach lighting is designed for a 25 ft.candle intensity in the reading plane, which makes reading comfortable during all conditions of service.
Insulation: Floors, sides, roofs and ends are thoroly insulated with a fireproof insulating material and, where structural connection is made between the interior finish and the outside frame a layer of this material is incorporated to break the metallic path. This care insures a minimum of noise transmission as well as temperature economy.
Windows: Double windows with aluminum sash, polished plate glass in the outer and safety glass on the inner pane, are installed to give a surface flush with the outside car sheathing. The inner sash is hinged to swing inward for cleaning.
Heating: All electric heat, using the system of combined floor and overhead duct heaters developed on the modernized cars, and controlled in three degrees by a selector in each section is used. Thermostats automatically regulate heat as desired.
Cooling: The air cooling system uses 600 v. compressors located under each of the center sections delivering compressed Freon gas.(a non-toxic gas, colorless and odorless at ordinary temperatures and pressures) by armored refrigerant lines to evaporators in overhead compartments in each section. In the evaporators the compressed Freon is allowed to expand, absorbing heat from the air passing over the cooling coils, thus cooling inside air, and the refrigerant is then returned to the compressors for recirculation. In cooling surplus humidity is automatically precipitated from the air to give a comfortable atmosphere. Selection of cooling rate is available in each section in 3 degrees, using the same switch that governs the heating rate.
Ventilation: The ventilation system is closely allied to the heating and cooling plants and must be operated to secure function of them. A battery operated ventilating fan set capable of circulating 1100 cubic feet of air per minute into the ventilating ducts is located adjacent to each evaporator and each fan set comprises two fans operated by a single motor arranged to draw 400 cf/m of fresh outside air and 700 cf/m of inside air thru filters, the exhaust blowing over the heating and cooling equipment for temperature adjustment to meet seasonal needs.




SCHEMATIC DIAGRAM OF AIR CONDITIONING SYSTEM
Simplified to show only the principal components
and the general principles used.

Headlights: Battery operated, 16" diameter, 32 volt, 250 watt.

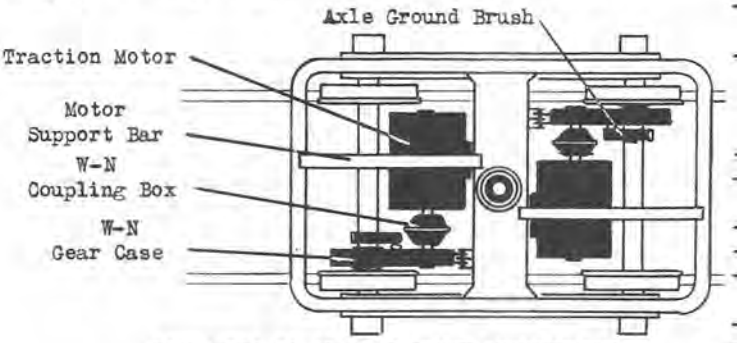
Tavern-Lounge Auxiliaries: This is the first time an interurban car has been equipped with a bar, and appropriately, all auxiliary equipment is electric: hot-water heater, stove, coffee maker and refrigerator. For flexibility and ease of control this equipment is operated on alternating current supplied by a 208 volt 3 phase motor-alternator set of 10 kilowatt capacity mounted under the lounge section. This set comprises, in addition to the alternator, an exciter supplying field excitation, and a 600 volt DC motor, and the AC supply is used on certain decorative lighting behind and below the bar as well as for the auxiliaries mentioned above.

The electric stoves, heavily used for the popular ELECTROBURGERS and other quick snacks, are unusual in that no heat is produced by the stove itself, which is the primary of a transformer whose secondary is the base of the cooking utensil.

Weight of Train Equipped but Without Load: 207, 400 lb.

Length over Anticlimbers: 155'-4". Width, at Side Sills: 8'-6 3/8", at windows: 9'-2".

Height, from Top of Running Rail over Top of Roof: 12' - 3 ¾"




SCHEMATIC DIAGRAM OF DRIVE ARRANGEMENT USED IN ELECTROLINER TRUCKS

-Truck Arrangement: All trucks are motored except center one.
-Type of Truck: Commonwealth, double-equalizers and bolster hydraulic shock absorbers, cast frame, coil springs only.
-Wheel Base: 7'-2"
-Truck Centers: 32'-8" under A & A1 Sections, 33'-8" intermed.
-Journals: 5" x 9" roller bearing.
-Wheels: 31" diam., rolled steel.
-Contour: AAR flange, cylindrical tread.
-Side Bearings: Roller type.
-Brake head tie rod safety hangers are made of messenger wire.

Structural: High tensile steels, principally Cor-Ten alloy, are used thruout the structure, to secure a maximum of strength and workability and assembly was effected entirely by electric welding, thus eliminating bolt heads, rivets, splice plates and other marks of construction which break up the smooth contours in conventional construction. The rounded contours of the ends were formed to shape and welded in place and the smooth job of shaping the headlight cowling and splicing it to the main shell is a masterpiece in fine workmanship. The framework pattern itself follows conventional form, consisting of center and side sills, end posts and uprights, carlines and sills, around which the exterior shell is built, and the interior trim and lining is attached largely thru the use of the new Phillips-head screws, having cross-shaped slots for speedier and neater assembly.

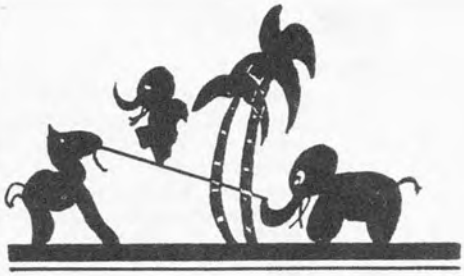
The adjacent sections are joined by a ball-and-socket type articulated joint in which the end sill of one section is framed into a ball casting while that of the next unit is framed into a socket casting, so that the completed sections have a firm snug bearing on one another without restricting the free relative movement on curves and grades.

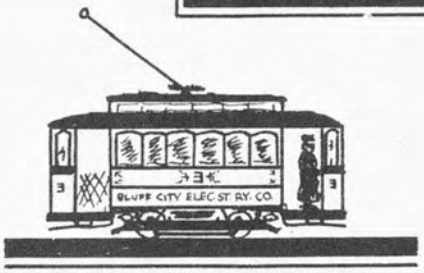
Another departure from conventional design is the absence of end vestibules and the substitution in their place of vestibules adjacent to each smoking section, and to compensate for the interruption of the side sills thru the step well, a fish-belly frame is carried around the openings.

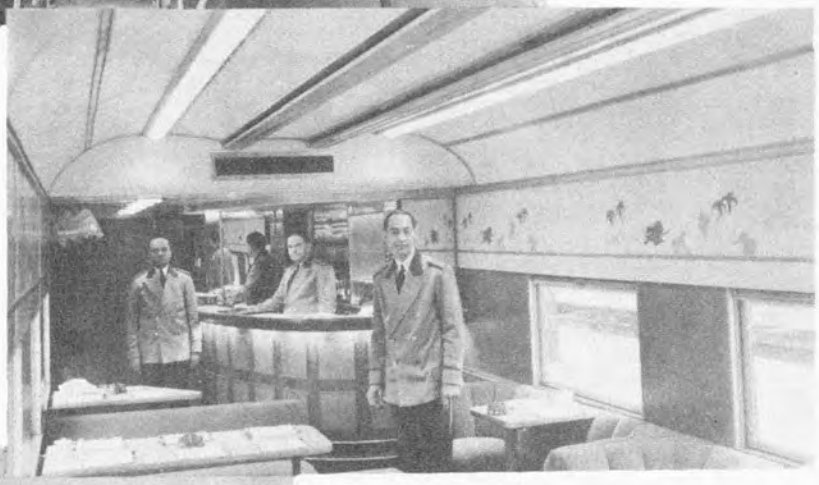
The pilots are built into the framework of the end sections and covered with a heavy sheeting integrated into the design of the bodies. Because of the necessary clearance to third rails used on the tracks of the Chicago Rapid Transit Company this pilot is 15½" above the running rail and is therefore supplemented by a wheel guard attached to the ends of the trucks nearest the pilots.

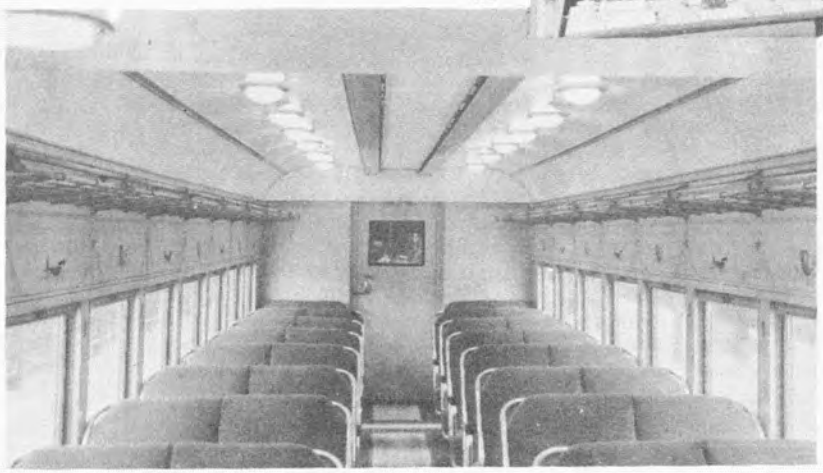
Drawbars: The Electroliners are normally operated singly but are equipped at each end with a retractable drawbar with fixed knuckle, normally concealed behind trap doors. A pipe connection to the train line is available to bring the brakes into action when deadheading the train behind other equipment. There is no draft gear on this emergency drawbar.

Diaphragms: One of the advantages of articulation on the Electroliners is that it makes possible continuous corridors thru the train with the use of canvas diaphragms between sections, similar to those used on steam railways. Electroliner diaphragms are hinged at one end on the bottom and may be unlocked at the top and pushed back to give access to trolley ropes and retrievers. (See Page 10 for diagram.)







inviting

Electroliner

interiors

MOTORS & CONTROL:

Nominal Line Voltage: 650 v DC from trolley except from overrunning third rail between Chicago terminal and Crawford Ave., Skokie northbound, and from Crawford Avenue, Skokie to Howard Street and Granville to terminal in Chicago southbound.

Motors: Westinghouse 1443-B1, 300 volt 125 hp., eight motors per train.

Drive: Single reduction spur gear "WN" drive, gear ratio 27:72. The motors are suspended parallel to the axles, but instead of resting on the axle they are entirely carried on the truck frame by means of a beam and are connected to the drive by a universal joint coupling that will accomodate the normal amount of relative motion between axle and truck frame. The WN box is sealed and lubricated with oil instead of solid grease.

Grounding: To avoid pitting of the roller journal bearings due to the ground return current which in ordinary equipment flows thru the journal brass to the axle, axle brushholders are provided and a copper brush bearing on the axle furnishes a direct path from the ground cable to the wheels.

Control: Westinghouse electropneumatic type HB operated from 32 v. battery, bridging circuit.

Switch Group: UP 44 with 7 double pole and 2 single pole switches in single group with reverser on end plate. Line switches (2) in case with dump valve for potential-loss protection. Master controller type XMA-1 with 9 series and 7 parallel notches and dead man control.

Field Control: Automatically operated field shunting picked up by current relay on last notch gives two degrees of field shunting using inductive shunts with regulating resistance. This equipment not installed on trains as built but was provided for in the future as need for increased speed developed, and will soon be installed, it is understood.

Battery Charging: 32 v. batteries are kept charged by 600 v. motor generator sets.

Transfer Switch: The change from trolley to third rail as a source of current is made by remote control of an electropneumatic transfer switch interlocked with the control to prevent operation in motoring positions. This switch is capable, however, of interrupting the auxiliary load and is equipped with contact tips and blowout coils similar to the conventional type of motor contactors.

NOTE: The motor and control equipment is arranged in effect to give in each train two complete four motor equipments with associated group, line and transfer switches, these two equipments operating in multiple-unit thru a train line. Two batteries and motor generator sets are also provided and are tied together with a 32 v. bus line to equalize the load. In the event of trouble with any part of the equipment on either motor section that section may be cut out by throwing a control cut-out in the engineer's cab and the train operated from the head end using the motor and control of the OK section only. There is no provision for multiple-unit operation of a single Electroliner coupled to any other equipment.

Fuses: The main circuits are protected by ribbon fuses at each third rail shoe and at the base of each trolley pole. There are third rail beams on each side of each truck except the center (trailer) truck. Lightning arresters are also located near each trolley.

Control of Auxiliaries: Lighting, heating, air conditioning, battery charging and air compressors are all controlled from Nofuze load centers in each section working on battery voltage and operating individual fused contactors located in a group under the car. The only 600 v. equipment inside the cars are the electric heaters and they are completely inaccessible to passengers or train crew.

Signal System: A low voltage buzzer runs thru a train line wire between the motorman's cab at each end and intermediate stations at each entry and each diaphragm and there is a pushbutton at each of these locations arranged so that operating any of the buttons sounds all the buzzers simultaneously.

Cab Heater-Defroster: A special type of cab heater has been installed behind each master controller and combined with a low voltage fan blower so that a stream of warm air can be blown onto the front window. The blower may be operated by itself also if desired but it must be in use to obtain the heater.

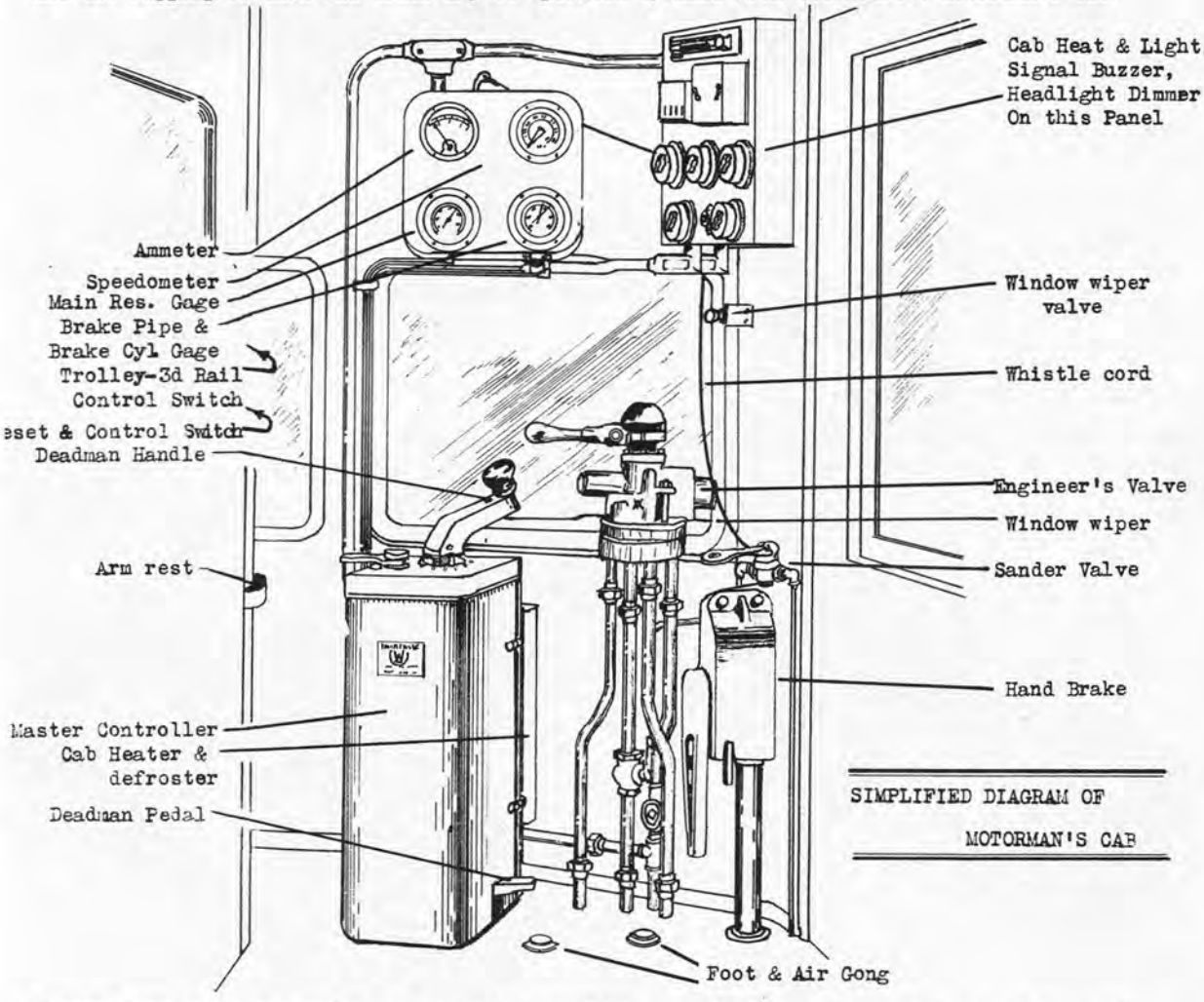
AIR BRAKE EQUIPMENT:

The air brake equipment is the same as used on a number of high speed diesel electric trains of other railroads, Westinghouse Air Brake Company's schedule HSC, a system incorporating features of both straight and automatic operation in a single engineer's valve having 5 positions: Release & Running, Self-lapping Service, Automatic Lap, Automatic Service, and Emergency. When the system is charged (compressors are of the conventional "bungalow" type, one on each motor section) brakes are released by moving the handle to the left to the release position and the train may be moved by applying power. In stopping, the power is removed by placing control handle in the "off" position and brakes are applied by moving the engineer's valve handle gradually to the right until the desired degree of brake cylinder pressure is obtained, holding this position until decreased pressure is desired and then gradually releasing by moving the handle back to the left. All of this working during a normal stop is done in the portion of the brake valve quadrant between Release and full Self Lapping Service and has the effect of raising the pressure in the Straight Air Brake Pipe in proportion to the displacement of the handle. The fluctuations in this pipe act on electromatic controllers on each section and these in turn on relay, control and magnet valves to regulate brake

cylinder pressure in proportion to Straight Air Brake Pipe pressure. Thus, battery actuated magnet valves give a quick electropneumatic response to movements of the engineers valve.

In the event of fault in the straight air operation the engineer's valve may be manipulated between Release, Automatic Lap, and Automatic Service, and if necessary, Emergency, in the conventional method to give normal automatic air brake operation, thru an Automatic Brake Pipe, and the functioning of the straight air system and associated brake pipe and valves will be by-passed. Charging of brakes is equalized between the two compressors on the train by means of a third train line pipe, called Main Reservoir Pipe, having a normal pressure of about 130 lb. The fully charged pressure of the Automatic Brake Pipe is 110 lb., and in order to supply the motor control equipment at 70 lb. a separate feed valve and control reservoir is provided on each motor section. There is only one governor controlling both compressors on each train; it is located under a seat near the entry on the A section, but either compressor may be cut out individually.

All brake rigging is contained in the trucks themselves and a brake cylinder on each side of each truck operates the brake shoes on the respective sides. These are arranged two per wheel to give clasp action. The cylinders are connected to the body by swing hose, and the rigging of each end truck may be operated by hand from the nearest motorman's cab.




SIMPLIFIED DIAGRAM OF MOTORMAN'S CAB

Window Wipers: A pneumatic air wiper is provided on each of the cab windows, including the center end windows as well as those directly before the motorman, and these are controlled by a small valve at the right of the front window.

Sanders: Pneumatic track sanders of the conventional type are provided on each end.

Trip Cock: An automatic trip cock required for protection at certain interlocking plants on the lines of the Chicago Rapid Transit Company, is suspended from the body in the rear of each pilot. This trip cock is connected to the Automatic Brake Pipe.

Whistles: A single tone pneuphonic horn similar to those in use on many trunk line trains is completely concealed under the roof sheathing behind the grill adjacent to the headlight and above the cab on each end of the trains.

Gongs: The alarm gong may be sounded by air or directly operated by foot. The air mechanism is of the multiple stroke type standard on most recent North Shore Line cars.

# BY RUTLS

NORTH SHORE LINE

# Electroliners ARE HERE!

America's First
ALL-ELECTRIC LUXURY TRAINS
5 Trips Each Way—Every Day
between
CHICAGO and MILWAUKEE
Plus 28 Other
Newly Designed Hourly Trains

## STARTING SUNDAY!
FEBRUARY 9

## The North Shore Line Will Place in Operation the Nation's Newest Trains

Here are trains so utterly new in design, so luxuriously appointed, that boarding an Electroliner is like stepping into an exclusive club! Not only are ELECTROLINERS powered electrically, they're actually the first all-electric luxury trains America has ever seen. From air-conditioning and heating to electro-pneumatic brakes, everything is electrically operated; even the temperature is electrically controlled . . . superbly Every spacious ELECTROLINER is smartly styled by master designers. Deep-upholstered seats . . . separate smoking lounges . . . superbly equipped Tavern-Lounge Cars with softly cushioned settees and unique refreshment appointments . . . rubber-cushioned trucks and sound and temperature-proofed insulation at every possible point . . . all combine to give you a matchless new experience in silent, smooth-flowing travel.

**World's Most Beautiful All-Electric Trains!**

Never before have you seen such incomparable use of colors . . . coral, blue and gold . . . apricot and turquoise . . . scarlet and gray . . . blend in varying motifs to give you pleasing and restful ultra-modern interiors.

**Low Coach Fares for Luxury Trains!**

Every ELECTROLINER travel facility is available to you at regular coach charge—no extra costs or higher fares . . . North Shore Line trains make regular Chicago Loop and North Side stations stops, including Belmont Ave., Wilson Ave. and Howard Street.

NORTH SHORE LINE

North Shore Line News

PUBLISHED BY AND FOR EMPLOYES OF THE CHICAGO NORTH SHORE AND MILWAUKEE RAILROAD

NO. 4

IMPORTANT
INFORMATION
FOR
EVERY TICKET AGENT
AND
PASSENGER REPRESENTATIVE
IN THE
UNITED STATES
CANADA AND MEXICO

SCHEDULE
Electroliner and Short Line SPECIAL TRAINS
FEBRUARY 6, 1941

NORTH SHORE LINE
Electroliner Premiere Luncheon
GLEN FLORA COUNTRY CLUB
Waukegan, Illinois
Thursday, February 6, 1941
Souvenir Menu
Fresh Gulfport Shrimp Cocktail
Chilled Appetizers and Relishes
Electroliner Prime Filet Mignon
Selected Fresh Mushrooms
Parsley New Potatoes
Buttered Garden Fresh Peas
Assorted Rolls
Pride of Illinois Home made Apple Pie
Mellow-tang Wisconsin Cheese
North Shore Line Special Blend Coffee
Tea or Milk

AN EPOCH

The premiere runs of the twin trains of tomorrow on the North Shore Line ELECTROLINERS, on which chapter in electric interurban railroad transportation in this country.

These all-electric luxury trains are the first of their kind ever to be built. They were designed by North Shore Line engineers. We believe that you agree that they are exceptional in their appointments.

They are, we think, the trains of tomorrow as the public's ...

NORTH SHORE LINE
Electroliners
TAVERN LOUNGE CAR

Electroliners
Electroliners
Electroliners
Electroliners

A FEW MILESTONES IN THE INTRODUCTION OF THE ELECTROLINERS

'ELECTROLINER' ON TRIAL RUN

Nation's First Electroliner In Test Run on North Shore

Greetings of the Season
CHICAGO NORTH SHORE AND MILWAUKEE RAILROAD COMPANY
1941

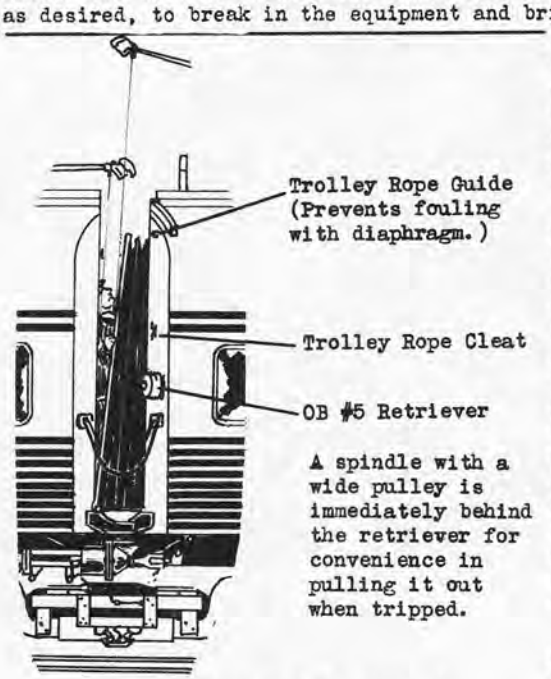
Chicago, North Shore & Milwaukee Railroad Co.
Train Order No. 16
Date 1-29 1941

Chicago, North Shore & Milwaukee Railroad Co.
Train Order No. 7
Date Feb 4 1941

38 CONVENIENT TRAINS EVERY DAY
10 of them Electroliners

PUTTING ELECTROLINERS IN SERVICE:

Within a few days after the delivery of the first Electroliners was completed at Milwaukee the mechanical department attached third rail beams, motor couplings and after a few preliminary stationary tests pronounced the train ready for its first test runs. There were several reasons for test runs: to determine if the equipment would function as desired, to break in the equipment and bring to light any defects for adjustment, and to give train crews an opportunity to become familiar with the technique of handling it under regular operating conditions. Acceding to popular demand one of the first test trips from Harrison Street to Racine was thrown open to representatives of Chicago and Milwaukee newspapers. On Friday, January 31, 1941, the 801-802 was brought over the tracks of the Chicago Rapid Transit Company from Skokie to the Loop and on to Roosevelt Road, using all tracks in succession and also entering pocket tracks at Wilson Avenue, North Water Stub and Wells Terminal to ascertain that satisfactory clearance would be obtained on all tracks the trains might be called upon to use in regular service. This test run was made during midnight hours so as not to interfere with daylight traffic and went off smoothly and gave the engineers a chance to suggest minor changes in third rail beam flashboard arrangement to insure reliability of operation even under possible abnormal conditions, as in sleet storms. About this time the second train was arriving at the shops.



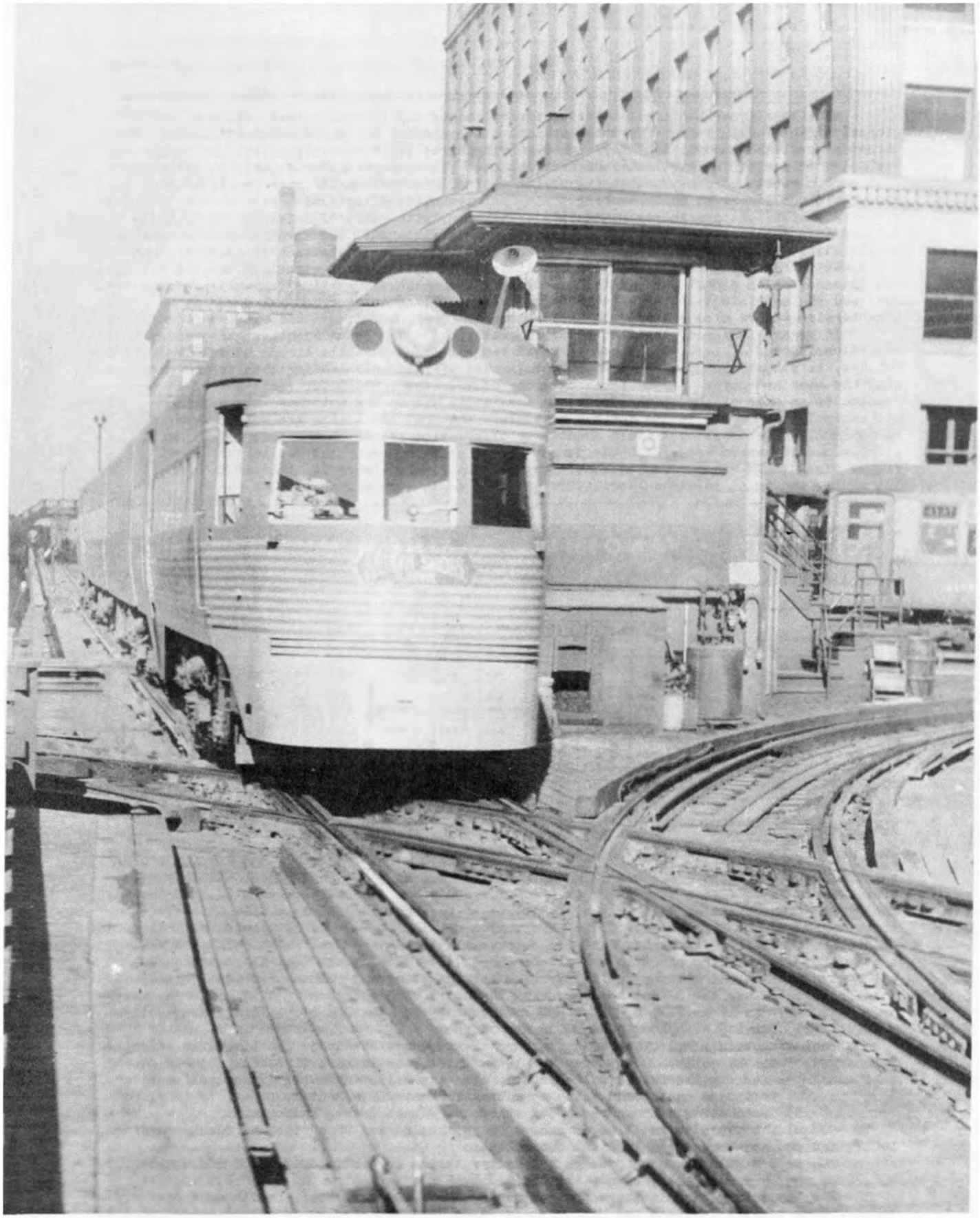

METHOD OF MANEUVERING TROLLEYS
Using Hinged Diaphragm

On Thursday, February 6, under the pressure of a promised February 9 service-inauguration date, a demonstration trip was made for the benefit of civic, industrial and press leaders of the territory served, using both trains, one leaving each terminal so as to arrive together at Waukegan where all joined in a premiere luncheon. It was on the return of the Milwaukee party from this gathering that 803-804 developed an unforeseen defect in one switch group, and while it was able to finish its run to Harrison Street, it had to be laid in the shop, the group removed and returned to the manufacturers' plant at Pittsburgh for overhaul. Quickly rising to meet this unfortunate situation the road assembled the newest of the recently modernized cars together with diner-lounge car 415 into a "Substitute Electroliner" to handle the work intended for the 803-804; this was preferable to placing the new train on the road under the double handicap of new service and only half its normal motive equipment.

In the meantime railfans from the entire midwest arranged their plans to be in Chicago Saturday afternoon, February 8 for CERA trip #29, the Electroliner Demonstration Trip, and 144 were on board the 801-802 as she pulled out of North Water Stub at 1:20pm. in the teeth of a biting blizzard on the first revenue trip made by either of the new streamline trains, a trip incidentally, that ran along to perfection and to the amazement of all of us, who were unanimous in agreeing that here was an electric interurban train that could well stand along the finest streamliner of any railroad in the land without fear of comparison. As a sidelight, the blizzard proved no obstacle to picture taking.

On Sunday, February 9 the new schedule went into effect and all trains were arranged to run as scheduled except that the Substitute Electroliner was to make the 5 trips normally covered by 803-804. However, these plans also got a severe test when a long freight Train of the Chicago & North Western Railway derailed due to a broken axle on a grade crossing with the North Shore Line at Ryan Tower, near Milwaukee, completely blocking the North Shore Line for about 8 hours and of course completely disrupting the car service. Emergency measures were at once instituted, with the result that standard equipment of all types was used on Milwaukee division trains until single tracking could be started and many who came out to see the first day's trains were, for the time being, disappointed.

But all these were simply links in a chain of unforeseeable coincidences that only serve to show the mettle of the operating force of a railroad as they adapt their facilities to meet the situation. In a matter of a little over a week the troublesome control equipment was received repaired and installed on the 803-804. After a day or so of test it assumed its share of the service and Electroliner operation became normal.



Electroliner passing Lake and Wells streets on the elevated railroad, Chicago, the World's busiest railroad crossing.

As with all new equipment numerous minor changes and additions were expected. Engineers began studying the performance of this new equipment the day the 801-802 first turned a wheel and are still at it, each day bringing to light some possibility of making still better use of the available characteristics. The transportation department too has kept very close tab of the functioning of the trains; one trainmaster rode practically every trip for the first month, noting timing and technique of operation with a view to pinching out wasted time wherever possible. Motormen, with years of Safety First training drilled into their systems, are disinclined to take advantage of the Electroliners' superior accelerating and braking qualities because they are so used to the standard equipment, and the judicious training of these men in handling Electroliners is of utmost importance to the transportation department. All these details are matters that time is rapidly caring for, and the consistent reliable on-time performance that characterizes all North Shore Line service is now also extended to Electroliners.

In regard to speed, the Electroliners really have IT. Being light weight trains the balancing speed, i.e., top speed on level tangent track in still air on normal line voltage, is subject to more fluctuation with amount of passenger loading than is the case with the standard cars. For this reason among others, the speedometer (driven from a magneto on an axle of the center truck) is a valuable aid to the motorman in governing his manipulation to secure the optimum schedule. Now that the trains are well broken in, the balancing speed, without field shunts, by observation, seems to be about 78 mph. with a full load of passengers. With the future field shunting equipment cut in this speed figure rises to 105 mph. The remarkable thing about Electroliners is, that at this speed the riding and sound insulating qualities are such as to seem only half that fast!

**CHICAGO • KENOSHA • RACINE • MILWAUKEE**
**Skokie Valley Route**

| CENTRAL STANDARD TIME | 423 BB | 425 BC | 807 ★ | 807 ★ | 427 D | 429 B | 809 ★ | 809 ★ | 431 | 433 | 435 | 437 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PM | PM | PM | PM | PM | PM | PM | PM | PM | PM | PM | PM |
| CHICAGO | | | | | | | | | | | | |
| Roosevelt Road.....Lv | 4.01 | 4.59 | 5.09 | 5.09 | 5.59 | 7.01 | 8.01 | 8.01 | 8.06 | 9.01 | 10.01 | 11.31 |
| Congress & Wabash..... " | 4.02 | 5.00 | 5.10 | 5.10 | 6.00 | 7.02 | 8.02 | 8.02 | 8.07 | 9.02 | 10.02 | 11.32 |
| Adams & Wabash..... " | 4.05 | 5.03 | 5.13 | 5.13 | 6.03 | 7.05 | 8.05 | 8.05 | 8.10 | 9.05 | 10.05 | 11.35 |
| Madison & Wabash..... " | 4.06 | 5.04 | 5.14 | 5.14 | 6.04 | 7.06 | 8.06 | 8.06 | 8.11 | 9.06 | 10.06 | 11.36 |
| Randolph & Wabash..... " | 4.07 | 5.05 | 5.15 | [illegible] | [illegible] | 7.07 | [illegible] | 8.07 | 8.12 | [illegible] | 10.07 | [illegible] |

ELECTROLINER SCHEDULES:

The determination of running and departure times, number of trips, and station stops to be made by Electroliners was a problem that must have evoked much argument and consideration. It is known that a very thoro traffic flow study was made to ascertain the originating and destination points as well as the quantities of passengers handled on Milwaukee division trains prior to the new service. This information quite probably was integrated with estimates of similar statistics for highway and competitive transportation traffic to point out what combination of operating conditions could be expected to attract the most NEW business and still give a practical headway and layover for the operating and maintenance standpoints. Finally selected was the 3-hour headway using the hours of 8 and 11 am., 2, 5 and 8 pm. northbound and 7:30 and 11 am., 2, 5, and 8 pm. southbound, with station stops (and consequently, running time) varying with hour of day and day of week.

Including both Electroliner and standard trains there are under the timetable effective February 9, 1941, 19 daily, 20 Saturday and 19 Sunday trains in each direction between Chicago and Milwaukee via the Skokie Valley route, with the following notes and exceptions:

a) Train 436 southbound daily operates via Shore Line Route

b) Train 412 southbound Saturday starts at Edison Court, Waukegan.

c) All above trains limited except 90 southbound and 95 northbound Sunday morning locals and 436 southbound local on the Shore Line.

d) 5 Electroliner trips each way daily, trains 800, 802, 804, 806 & 808 southbound, 801, 803, 805, 807 & 809 northbound; all limited trains.

For the information of those who may wonder about the excess of 1 northbound over southbound trains between Waukegan and Milwaukee on Saturday, this problem is solved by redistributing the car service on the remaining trains.

A glance over the operating timecard of February 9, 1941, No. 49, shows Electroliners figured at 70-75 schedule speed mph in open country between city limits of terminals, and overall schedule speed of over 48 mph on regular trips and 52.2 mph on non-stop trips.

TRAFFIC & ADVERTISING PREPARATIONS FOR ELECTROLINERS:

Of course railroads have put streamline trains into action many times in the last 7 years and each has called for a lot of painstaking and expensive advertising and traffic work, but this is the first time anything of this importance has occured in the electric railway field and the occasion is further complicated by the highly competitive local transportation picture. Not the least of the problems presented by the Electroliners, then, was that of acquainting the public with the new service so that the maximum use would be made of it without detracting from the use of other North Shore Line services.

A thoroughgoing publicity campaign was executed, beginning with a small two-color "WATCH FOR THE ELECTROLINERS" insert distributed with almost a million Chicago area electric railway maps, running the gamut of teaser and follow-up posters in sizes ranging from 22" x 14" up to a banner 5' x 60' and bill board 10' x 40' in sufficient quantities to cover display space in all cars, stations and vantage points on the "L" as well as on the North Shore Line; greeting card-calendars sent to customers, special window displays in principal terminals and travel agencies, and newspaper ads in sizes up to 5 columns x 18" in all the principal papers of the territory. Most novel publicity was the "Facsimile Interline Ticket" distributed to ticket agents thruout the country, containing Electroliner information arranged to resemble the well known yard-long interline ticket forms.

OUR DESIRE:

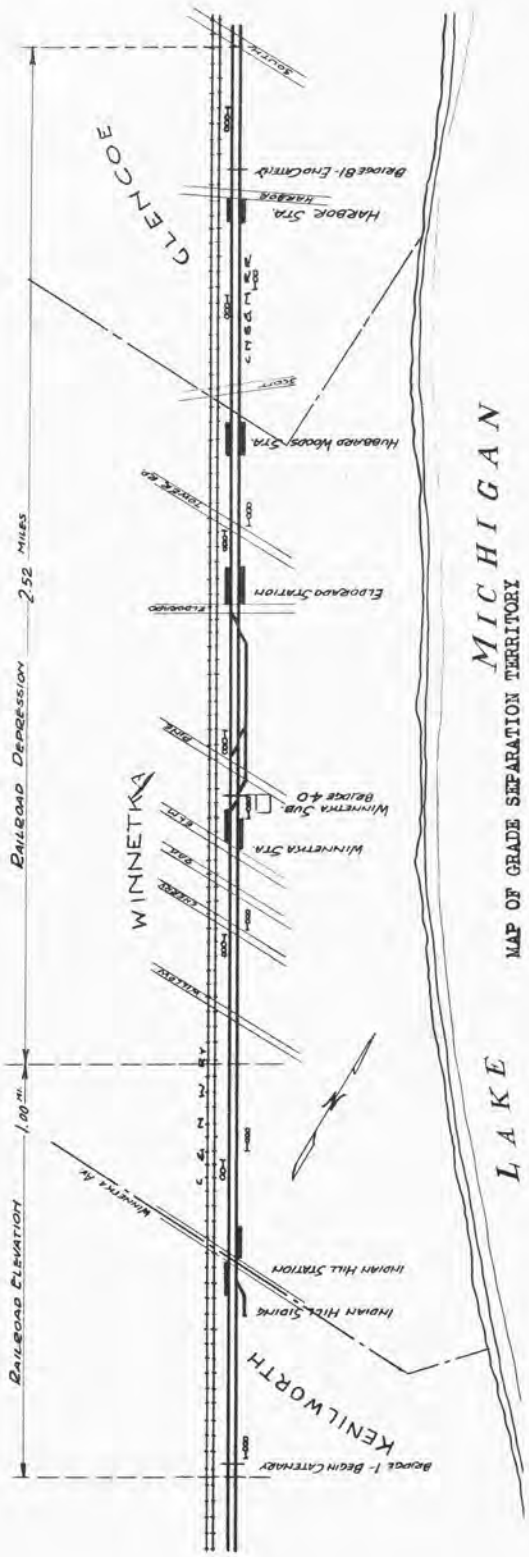
To treat every customer as though he or she were the only customer we have.

North Shore Line

ALTHO ELECTROLINER PUBLICITY GAVE THE ADVERTISING MEN THE CHANCE TO STRETCH THEIR LEGS NORTH SHORE LINE PUBLICITY IS ALWAYS FIRST-RATE

Most beautiful publicity — the four color brochure, containing full color interior and exterior views of the new trains together with sensibly worded descriptive copy, treating not only the Electroliners but also the modernized -- pardon us, the "newly-designed" -- cars. The current timetable covers utilize a very similar color job and copy, with the wise addition of a few words and a color plate of a freight train.

Among the not-to-be-forgotten tiny details that combine to complete the Electroliner advertising scene are the 3 color die-cut Electroliner souvenir menus, Electroliner dishware, napkins, cocktail stirrers, letterheads and envelopes. An unexpected but quickly executed part of the Electroliner program was the preparation of adequate notices to inform the public during the week that 803-804 was held out of service. These are only the most obvious of the many parts of the program of informing the world about Electroliners, a program that is of course only just beginning. Much interest of the public in these new trains aided the work of the publicity men. W-G-N, prominent Chicago radio station, sent a "sidewalk interview" with company officials, civic men, the train crew, on the February 6 preview trip before a wide listening audience. The trade papers, very much interested in improving the electric railway picture, gave Electroliners "Redball" handling, and even this very bulletin reaching out to railfans in all parts of the country and overseas is evidence of the broad interest in Electroliners.




WINNETKA GRADE SEPARATION:

The most important current improvement to the fixed plant of the North Shore Line is the grade separation project thru the Village of Winnetka, a project costing nearly three and one-half million, divided $1,000,000 to the Village, $500,000 to the C&NWRy, $395,000 and the remainder to the PWA. The railroads bisect the Village and the project was necessary to eliminate the delays and hazard attendent on level crossings. The Village lies generally on a hill so the logical plan called for cut thru the hill and fill in the hollow to the south.

In the execution of the separation 21 miles of temporary and permanent railroad, 1 railroad bridge, and 5 stations were built; 11 grade crossings and about 1000 ft. of street operation in Hubbard Woods were eliminated from the North Shore Line.

At the start of work the CNS&M tracks were shifted eastward and C&NW tracks westward and enough cut and fill made to allow construction of two temporary tracks and temporary overhead for the North Shore Line. The ground level CNS&M tracks were then removed and cut and fill made on this right-of-way for permanent North Shore Line tracks which were then built, along with overhead and permanent stations. Final step was the realinement of the west tracks in the cut for the C&NW and the removal of their old level tracks.

The North Shore Line stations are of the high level type except at Indian Hill. Bridges for the catenary system or inverted U form with wide flange I section, welded to shape. There are 81 of these bridges, including 11 for three tracks and 3 anchor bridges of slightly different design, spaced at intervals of approximately 200 ft. The overhead is similar to that used on the Skokie Valley using primary and secondary messengers and 4/0 grooved trolley. Rail is 100 lb. ASCE section with 11"-400,000 cm. copper rail joint bonds.

This project is now completed, as far as the North Shore Line's tracks are concerned.

OTHER IMPROVEMENTS TO WAY & STRUCTURES:

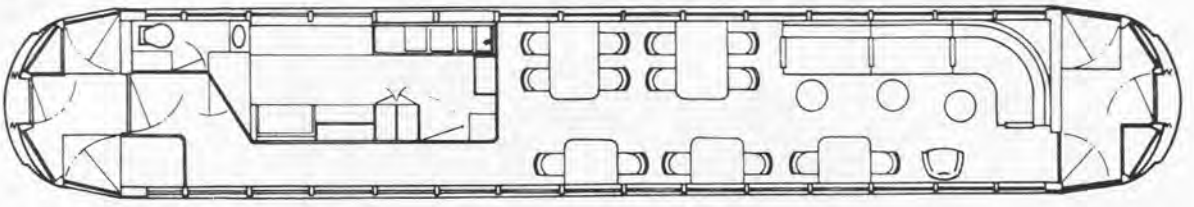
Much preparation for the Electroliners was carried out by the road department. Stringlining, a quick approximation method, was used in adjusting the realinement of open line curves for 90 mph. with smooth transitional approaches from and to tangent. Just before the trains arrived 500 tons of new 100 lb. rail was installed between Lake Ave. and Northfield on the Skokie. Last year new 102 lb. rail in pavement was laid over a part of the city tracks used by interurbans in Milwaukee and this year more is to be renewed. Ballasting has been done extensively in reconditioning track. Signalling was extended and electric locking and spring buffers installed near Oklahoma Ave., Milwaukee. Crossing warning protection circuits have been extended to care for higher top speeds.

At Milwaukee shops a transfer table was installed to permit the changing of a truck under the Electroliners without disturbing the other trucks of a train.

Another valued improvement is the rebuilding and enlarging of the ramp facilities at the Montrose Ave., Chicago, freight terminal. At this terminal semi-trailers are backed onto special flat cars for transport by rail to destination where they are again handled by truck to consignee's door. The new layout doubles the track and allows continuous and flexible operation and reduced ramp gradient expedites movements in slippery weather.

MODERNIZED CARS:

Preliminary to the Electroliners was a program of revamping of rolling stock in use on both the suburban and thru routes. This equipment was in excellent mechanical condition and capable of the type of operation the public has come to expect of railroads, but lacked some of the refinements in styling and color that have now been incorporated in them. This modernization program included a 12 point program (detailed in CERA Bulletin 13, March 1940) including new seating, heating, lighting, ventilation and redecoration and was entirely worked out and executed in the Highwood shops by the railroad's own forces, except for the selection and combination of colors, for which an artist was called in on consultation.



FLOOR PLAN OF MODERNIZED DINER-LOUNGE CARS 415, 417

The diner-lounge cars have an entirely new floor plan, including off-center bulkhead door, J shaped lounge and even potted-palms. The decorations include a boy-and-girl motif on the order of those used in the Electroliners. New stainless steel kitchen fittings help speed up the work of the chef. New golden curtains, cushioned parcel racks and a deep carpet complete the luxurious effect. In service, the two diners make three trips each daily-except-Sunday, giving a breakfast, luncheon and supper service. Details of the 42 modernized cars are given in the tabulation below:

| NUMBER SERIES | No. of Cars | ORIGINAL BUILDER | REBLDG. PROGRAM | TYPE OF SEATS INSTALLED | ASSIGNED SERVICE | TYPE OF ACCOMODATIONS |
|---|---|---|---|---|---|---|
| 415,417 | 2 | Cincinnati | 2 | New Special | Skokie Valley | Diner - Lounge (Tavern) |
| 712-715 | 4 | Cincinnati | 2 | Old Walkover | Shore Line | Passenger-smoking |
| 716-719 | 4 | Cincinnati | 1 | Old Walkover | Shore Line | Passenger-smoking |
| 720 | 1 | Cincinnati | 2 | New Swivel | Skokie Valley | Passenger-smoking |
| 721-725 | 5 | Cincinnati | 1 | Old Walkover | Shore Line | Passenger-smoking |
| 726 | 1 | Cincinnati | 2 | New Swivel | Skokie Valley | Passenger-smoking |
| 727-729 | 3 | Cincinnati | 1 | Old Walkover | Shore Line | Passenger-smoking |
| 730 | 1 | Cincinnati | 2 | New Swivel | Skokie Valley | Passenger-smoking |
| 731-733 | 3 | Cincinnati | 1 | Old Walkover | Shore Line | Passenger-smoking |
| 734-736* | 3 | Jewett | 2 | New Walkover | Shore Line | Passenger-smoking |
| 737-740 | 4 | Pullman | 2 | New Swivel | Skokie Valley | Passenger-smoking |
| 741-744 | 4 | Pullman | 1 | New Walkover | Skokie Valley | Passenger-smoking |
| 746-751 | 6 | Pullman | 1 | New Walkover | Skokie Valley | Passenger-smoking |
| 752 | 1 | Standard | 2 | New Swivel | Skokie Valley | Passenger-smoking |

*Rebuilt in 1926 by Cincinnati Car Company.

WHAT ELECTROLINERS MEAN TO THE FUTURE OF ELECTRIC RAILWAYS:

More than a new train is symbolized by the advent of the streamline articulated Electroliners; they are the emblem of a determination to show that the interurban electric railway can be made a valued part of the up-to-date transportation picture, perfectly well suited to the handling of a fast comfortable service on close headway. They show the WILL TO SUCCEED, the ability to meet changing transit conditions and still to preserve the fundamental economies and advantages of electric railed transportation. Electric railways, coast to coast, please note.

"AN INTERURBAN GOES MODERN" -- Bulletin Number 23 -- CENTRAL ELECTRIC RAILFANS' ASSOCIATION

This is one of a series of bulletins issued by CERA dealing with the history, equipment, and operation of electric railways. Single copies of this bulletin may be secured at 25¢ by addressing at association at 1240 Edison Building, Chicago.

Cover Photo from a Kodachrome by Charles E. Keevil. Mr. Keevil also made the drawing of the tavern-lounge car floor plan above. Rear cover, CERA photo by R. D. Kimmel.

Story of the Electroliners by George Krambles; Editorial Assistants: Charles A. Brown, Wallace M. Rogers, Bernard L. Stone and Allan Victor.

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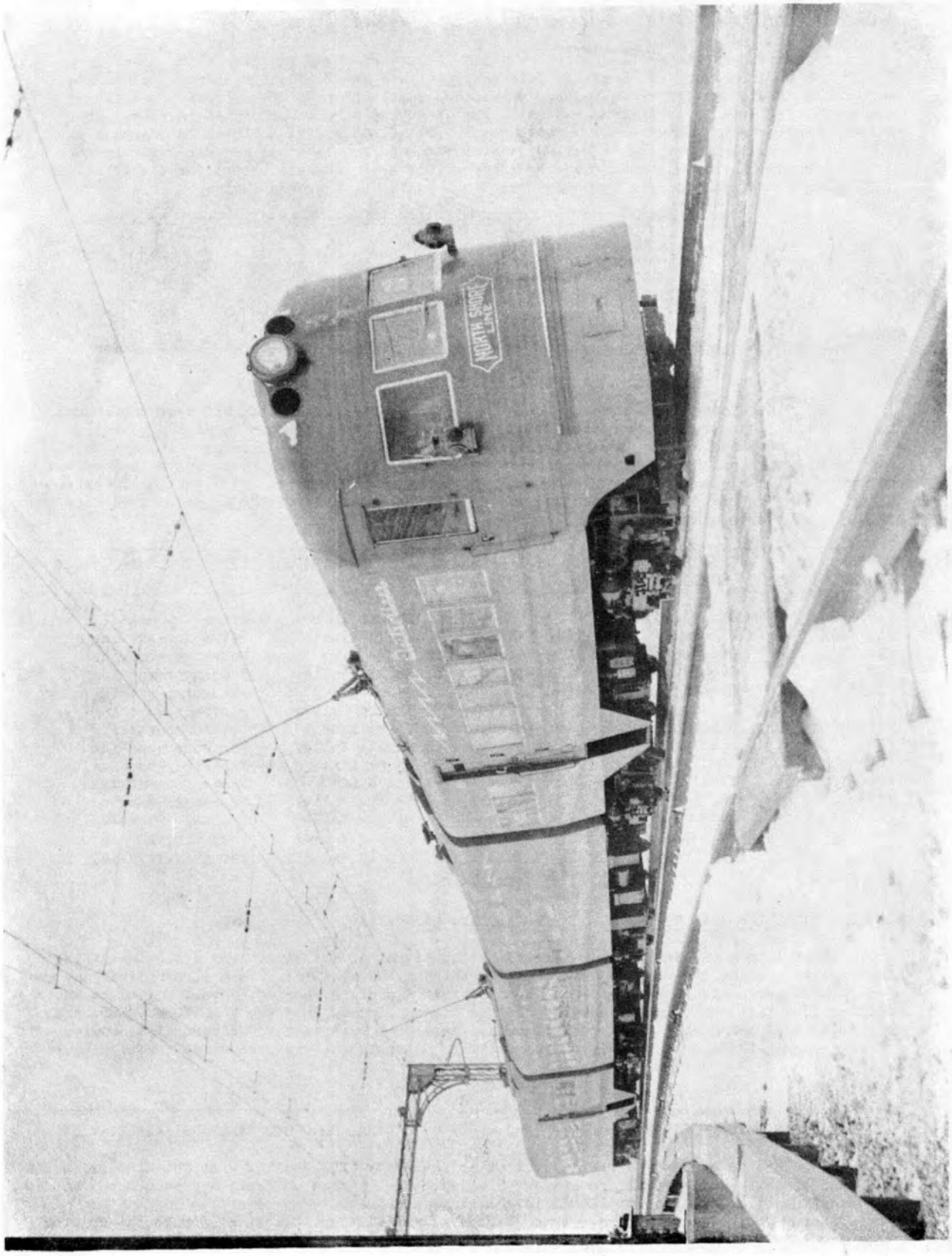
NORTH SHORE
LINE